



## SEQUENCE LISTING

&lt;110&gt; NIKLASSON, BO

&lt;120&gt; NEW PICORNAVIRUSES, VACCINES AND DIAGNOSTIC KITS

&lt;130&gt; 03786.002

&lt;140&gt; 09/147,801

&lt;141&gt; 1999-03-11

&lt;150&gt; PCT/SE97/01515

&lt;151&gt; 1997-09-09

&lt;160&gt; 25

&lt;170&gt; PatentIn Ver. 2.1

&lt;210&gt; 1

&lt;211&gt; 264

&lt;212&gt; DNA

&lt;213&gt; Ljungan virus

&lt;400&gt; 1

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agtctagtct tatcttgat gtgtcctgca ctgaacttgt ttctgtctct ggagtgtctct 60
acacttcagt aggggctgta cccgggcggt cccactcttc acaggaatct gcacaggtgg 120
ctttcacctc tggacagtgc attccacacc cgctccacgg tagaagatga tgtgtgtctt 180
tgcttgtgaa aagcttgtga aaatcgtgtg taggcgtagc ggctacttga gtgccagcgg 240
attacccta gtggtaacac tagc 264
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&lt;210&gt; 2

&lt;211&gt; 264

&lt;212&gt; DNA

&lt;213&gt; Ljungan virus

&lt;220&gt;

&lt;221&gt; modified\_base

&lt;222&gt; (1)..(264)

&lt;223&gt; "n" represents a, t, c, g, other or unknown

&lt;400&gt; 2

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agtctagttt cattctgtgt gtgtttggca ctgaaattat ttctgtctct ggggtgcttt 60
acacttcagt aggggctgta cccgggcggt cccactcttc acaggaatnt gcacaggtgg 120
ctttcacctc tggacagtgc attccacacc cgctccacag tagaagatga tgtgtgtctt 180
tgcttgtgaa aagcttgtga aaatcgtgtg taggcgtagc ggntacttga gtgccagcgg 240
acnacccta gtggtaacac tagc 264
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&lt;210&gt; 3

&lt;211&gt; 264

&lt;212&gt; DNA

&lt;213&gt; Ljungan virus

&lt;400&gt; 3

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agtttggttc tctcttgagt gtgttttgtg ttagcataat ttctgtctct agagtgtctt 60
acactctagt aggggctgta cccgggcggt cccactcttc acaggaatct gcacaggtgg 120
ctttcacctc tggacagtgc attccatacc cgctccacaa tagaagatga tgtatatctt 180
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tgtttgtgaa atgctcatga aacgtgtgtg taggcgtagc ggctacttga atgccagcgg 240  
 aaccccccta gtggtaacac tagc 264

<210> 4  
 <211> 179  
 <212> PRT  
 <213> Ljungan virus

<400> 4  
 Lys Asp Leu Met Glu Ile Ala Arg Met Pro Ser Val Tyr Lys Gly Glu  
 1 5 10 15  
 Arg Thr Glu Pro Gly Gly Thr Asn Gly Tyr Phe Gln Trp Ser His Thr  
 20 25 30  
 His Ser Pro Ile Asn Trp Val Phe Asp Gly Gly Ile His Leu Glu Asp  
 35 40 45  
 Met Pro Asn Leu Asn Leu Phe Ser Ser Cys Tyr Asn Tyr Trp Arg Gly  
 50 55 60  
 Ser Thr Val Leu Lys Leu Thr Val Tyr Ala Ser Thr Phe Asn Lys Gly  
 65 70 75 80  
 Arg Leu Arg Met Ala Phe Phe Pro Ile Met Met Gln Gly Thr Gln Arg  
 85 90 95  
 Lys Lys His Lys Cys Leu Phe Met Val Cys Asp Ile Gly Leu Asn Asn  
 100 105 110  
 Thr Phe Glu Met Thr Ile Pro Tyr Thr Trp Gly Asn Trp Met Arg Pro  
 115 120 125  
 Thr Arg Gly Ser Val Ile Gly Trp Leu Arg Ile Asp Val Leu Asn Arg  
 130 135 140  
 Leu Thr Tyr Asn Ser Ser Ser Pro Asn Ala Val Asn Cys Ile Leu Gln  
 145 150 155 160  
 Val Lys Met Gly Asn Asp Ala Lys Phe Met Val Pro Thr Thr Ser Asn  
 165 170 175  
 Ile Val Trp

<210> 5  
 <211> 241  
 <212> DNA  
 <213> Cardiovirus

<400> 5  
 tgacagggtt attttcacct cttcttttct actccacagt gttctatact gtggaagggt 60  
 atgtgttgcc ctttccttct tggagaacgt gcgcggcggt ctttcctgtct ctgcacaagc 120  
 gcgcgtgcaa catacagagt aacgcgaaga aagcagttct cggctctagct ctagtgccca 180  
 caagaaaaca gctgtagcga ccacacaaag gcagcggaac cccctcctg gtaacaggag 240  
 c 241

<210> 6  
 <211> 243  
 <212> DNA  
 <213> Cardiovirus

<400> 6  
 tgacagggtt attttcacct cttctctctt ctacttcata gtgttctata ctatgaaagg 60  
 gtatgtgtcg ccccttcctt cttggagaac gtgcgtggcg gtctttccgt ctctcgaaaa 120  
 acgtgcgtgc gacatgcaga gtaacgcaaa gaaagcagtt cttggtctag ctctggtgcc 180  
 cacaagaaaa cagctgtagc gaccacacaa aggcagcgga aacccctcc tggtaacagg 240  
 agc 243

<210> 7  
 <211> 247  
 <212> DNA  
 <213> Cardiovirus

<400> 7  
 aggccggtgt gcgtttgtct atatgttatt ttccaccata ttgccgtctt ttggcaatgt 60  
 gagggcccg aaacctggcc ctgtcttctt gacgagcatt cctaggggtc tttccctct 120  
 cgccaaagga atgcaaggtc tgttgaatgt cgtgaaggaa gcagttcctc tggaagcttc 180  
 ttgaagacaa acaacgtctg tagcgaccct ttgcaggcag cggaaccccc cacctggcga 240  
 caggtgc 247

<210> 8  
 <211> 188  
 <212> PRT  
 <213> Cardiovirus

<400> 8  
 Ser Asp Leu Leu Glu Leu Cys Lys Leu Pro Thr Phe Leu Gly Asn Pro  
 1 5 10 15  
 Asn Thr Asn Asn Lys Arg Tyr Pro Tyr Phe Ser Ala Thr Asn Ser Val  
 20 25 30  
 Pro Ala Thr Ser Met Val Asp Tyr Gln Val Ala Leu Ser Cys Ser Cys  
 35 40 45  
 Met Ala Asn Ser Met Leu Ala Ala Val Ala Arg Asn Phe Asn Gln Tyr  
 50 55 60  
 Arg Gly Ser Leu Asn Phe Leu Phe Val Phe Thr Gly Ala Ala Met Val  
 65 70 75 80  
 Lys Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro  
 85 90 95  
 Thr Thr Arg Asp Gln Ala Met Gln Ser Thr Tyr Ala Ile Trp Asp Leu  
 100 105 110  
 Gly Leu Asn Ser Ser Phe Asn Phe Thr Ala Pro Phe Ile Ser Pro Thr  
 115 120 125

His Tyr Arg Gln Thr Ser Tyr Thr Ser Pro Thr Ile Thr Ser Val Asp  
130 135 140

Gly Trp Val Thr Val Trp Lys Leu Thr Pro Leu Thr Tyr Pro Ser Gly  
145 150 155 160

Thr Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp  
165 170 175

Phe Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 9

<211> 188

<212> PRT

<213> Cardiovirus

<400> 9

Ser Asp Leu Leu Glu Leu Cys Lys Leu Pro Thr Phe Leu Gly Asn Pro  
1 5 10 15

Ser Thr Asp Asn Lys Arg Tyr Pro Tyr Phe Ser Ala Thr Asn Ser Val  
20 25 30

Pro Ala Thr Ser Leu Val Asp Tyr Gln Val Ala Leu Ser Cys Ser Cys  
35 40 45

Met Ala Asn Ser Met Leu Ala Ala Val Ala Arg Asn Phe Asn Gln Tyr  
50 55 60

Arg Gly Ser Leu Asn Phe Leu Phe Val Phe Thr Gly Ala Ala Met Val  
65 70 75 80

Lys Gly Lys Phe Arg Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro  
85 90 95

Thr Thr Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu  
100 105 110

Gly Leu Asn Ser Ser Phe Asn Phe Thr Ala Pro Phe Ile Ser Pro Thr  
115 120 125

His Tyr Arg Gln Thr Ser Tyr Thr Ser Pro Thr Ile Thr Ser Val Asp  
130 135 140

Gly Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly  
145 150 155 160

Thr Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp  
165 170 175

Phe Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 10

<211> 188

&lt;212&gt; PRT

&lt;213&gt; Cardiovirus

&lt;400&gt; 10

Ser Asp Leu Leu Glu Leu Cys Lys Leu Pro Thr Phe Leu Gly Asn Pro  
 1 5 10 15

Ser Thr Asp Asn Lys Arg Tyr Pro Tyr Phe Ser Ala Thr Asn Ser Val  
 20 25 30

Pro Ala Thr Ser Leu Val Asp Tyr Gln Val Ala Leu Ser Cys Ser Cys  
 35 40 45

Met Ala Asn Ser Met Leu Ala Ala Val Ala Arg Asn Phe Asn Gln Tyr  
 50 55 60

Arg Gly Ser Leu Asn Phe Leu Phe Val Phe Thr Gly Ala Ala Met Val  
 65 70 75 80

Lys Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro  
 85 90 95

Thr Thr Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu  
 100 105 110

Gly Leu Asn Ser Ser Phe Asn Phe Thr Ala Pro Phe Ile Ser Pro Thr  
 115 120 125

His Tyr Arg Gln Thr Ser Tyr Thr Ser Pro Thr Ile Thr Ser Val Asp  
 130 135 140

Gly Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly  
 145 150 155 160

Thr Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp  
 165 170 175

Phe Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
 180 185

&lt;210&gt; 11

&lt;211&gt; 188

&lt;212&gt; PRT

&lt;213&gt; Cardiovirus

&lt;400&gt; 11

Ser Asp Leu Leu Glu Leu Cys Lys Leu Pro Thr Phe Leu Gly Asn Pro  
 1 5 10 15

Asn Ser Asn Asn Lys Arg Tyr Pro Tyr Phe Ser Ala Thr Asn Ser Val  
 20 25 30

Pro Thr Thr Ser Leu Val Asp Tyr Gln Val Ala Leu Ser Cys Ser Cys  
 35 40 45

Met Ala Asn Ser Met Leu Ala Ala Val Ala Arg Asn Phe Asn Gln Tyr  
 50 55 60

Arg Gly Ser Leu Asn Phe Leu Phe Val Phe Thr Gly Ala Ala Met Val  
65 70 75 80

Lys Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro  
85 90 95

Thr Thr Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu  
100 105 110

Gly Leu Asn Ser Ser Phe Val Phe Thr Ala Pro Phe Ile Ser Pro Thr  
115 120 125

His Tyr Arg Gln Thr Ser Tyr Thr Ser Ala Thr Ile Ala Ser Val Asp  
130 135 140

Gly Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly  
145 150 155 160

Ala Pro Val Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp  
165 170 175

Phe Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 12

<211> 187

<212> PRT

<213> Cardiovirus

<220>

<221> MOD\_RES

<222> (102)

<223> variable or unknown amino acid

<400> 12

Thr Asp Leu Leu Glu Leu Cys Lys Leu Pro Thr Phe Leu Gly Asn Leu  
1 5 10 15

Ser Asn Asp Thr Arg Val Pro Phe Phe Thr Ala Thr Asn Ser Val Pro  
20 25 30

Thr Glu Ser Leu Val Glu Tyr Gln Val Thr Leu Ser Cys Ser Cys Met  
35 40 45

Ser Asn Ser Met Leu Ala Ser Val Ala Arg Asn Phe Asn Gln Tyr Arg  
50 55 60

Gly Ser Leu Asn Phe Leu Phe Val Phe Thr Gly Ser Ala Met Thr Lys  
65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
85 90 95

Thr Arg Asp Gln Ala Xaa Gln Ser Thr Tyr Ala Ile Trp Asp Leu Gly  
100 105 110

Leu	Asn	Ser	Ser	Phe	Asn	Phe	Thr	Val	Pro	Phe	Ile	Ser	Pro	Ser	His
		115					120					125			
Tyr	Arg	Gln	Thr	Ser	Tyr	Thr	Ser	Pro	Ser	Ile	Ala	Ala	Val	Asp	Gly
	130					135					140				
Trp	Leu	Thr	Val	Trp	Gln	Leu	Thr	Pro	Leu	Thr	Phe	Pro	Ala	Asn	Val
145					150					155					160
Pro	Pro	Ser	Ser	Asp	Ile	Leu	Thr	Leu	Val	Ser	Ala	Gly	Asn	Asp	Phe
				165					170					175	
Thr	Leu	Arg	Met	Pro	Ile	Ser	Pro	Thr	Lys	Trp					
			180					185							

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<210> 13
<211> 187
<212> PRT
<213> Cardiovirus
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<div>&lt;400&gt;</div>	13															
Lys	Asp	Phe	Leu	Glu	Ile	Ala	Gln	Ile	Pro	Thr	Phe	Ile	Gly	Asn	Lys	
1				5					10					15		
Ile	Pro	Asn	Ala	Val	Pro	Tyr	Ile	Glu	Ala	Ser	Asn	Asn	Ala	Val	Lys	
			20					25					30			
Thr	Gln	Pro	Leu	Ala	Thr	Tyr	Gln	Val	Thr	Leu	Ser	Cys	Ser	Cys	Leu	
		35					40					45				
Ala	Asn	Thr	Phe	Leu	Ala	Ala	Leu	Ser	Arg	Asn	Phe	Ala	Gln	Tyr	Arg	
	50					55					60					
Gly	Ser	Leu	Val	Tyr	Thr	Phe	Val	Phe	Thr	Gly	Thr	Ala	Met	Met	Lys	
65					70					75					80	
Gly	Lys	Phe	Leu	Ile	Ala	Tyr	Thr	Pro	Pro	Gly	Ala	Gly	Lys	Pro	Thr	
				85					90					95		
Ser	Arg	Asp	Gln	Ala	Met	Gln	Ala	Thr	Tyr	Ala	Ile	Trp	Asp	Leu	Gly	
			100					105					110			
Leu	Asn	Ser	Ser	Tyr	Ser	Phe	Thr	Val	Pro	Phe	Ile	Ser	Pro	Thr	His	
	115						120					125				
Phe	Arg	Met	Val	Gly	Thr	Asp	Gln	Val	Asn	Ile	Thr	Asn	Val	Asp	Gly	
	130					135					140					
Trp	Val	Thr	Val	Trp	Gln	Leu	Thr	Pro	Leu	Thr	Tyr	Pro	Pro	Gly	Cys	
145					150					155					160	
Pro	Thr	Ser	Ala	Lys	Ile	Leu	Thr	Met	Val	Ser	Ala	Gly	Lys	Asp	Phe	
				165					170					175		
Ser	Leu	Lys	Met	Pro	Ile	Ser	Pro	Ala	Pro	Trp						
			180					185								

<210> 14  
 <211> 187  
 <212> PRT  
 <213> Cardiovirus

<400> 14

Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
 1 5 10 15

Ile Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
 20 25 30

Thr Gln Pro Leu Ala Thr Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
 35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
 50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
 65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
 85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
 100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
 115 120 125

Phe Arg Met Val Gly Thr Asp Gln Pro Thr Ile Thr Ser Val Asp Gly  
 130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
 145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
 165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
 180 185

<210> 15  
 <211> 187  
 <212> PRT  
 <213> Cardiovirus

<400> 15

Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
 1 5 10 15

Ile Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Thr Ala Val Lys  
 20 25 30

Thr Gln Pro Leu Ala Thr Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
 35 40 45



Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
115 120 125

Phe Arg Met Val Gly Thr Asp Gln Pro Thr Ile Thr Ser Val Asp Gly  
130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 16  
<211> 187  
<212> PRT  
<213> Cardiovirus

<400> 16  
Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
1 5 10 15

Ile Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
20 25 30

Thr Gln Pro Leu Ala Thr Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
115 120 125

Phe Arg Met Val Gly Thr Asp Gln Pro Thr Ile Thr Ser Val Asp Gly  
130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 17

<211> 187

<212> PRT

<213> Cardiovirus

<400> 17

Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
1 5 10 15

Ile Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
20 25 30

Thr Gln Pro Leu Ala Thr Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
115 120 125

Phe Arg Met Val Gly Thr Asp Gln Pro Thr Ile Thr Ser Val Asp Gly  
130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
180 185

<210> 18  
 <211> 187  
 <212> PRT  
 <213> Cardiovirus

<400> 18

Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
 1 5 10 15

Ile Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
 20 25 30

Thr Gln Pro Leu Ala Thr Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
 35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
 50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
 65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
 85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
 100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
 115 120 125

Phe Arg Met Val Gly Thr Asp Gln Pro Thr Ile Thr Ser Ala Asp Gly  
 130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
 145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
 165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
 180 185

<210> 19  
 <211> 187  
 <212> PRT  
 <213> Cardiovirus

<400> 19

Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
 1 5 10 15

Met Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
 20 25 30

Thr Gln Pro Leu Ala Val Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
 35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
 50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
 65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
 85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
 100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
 115 120 125

Phe Arg Met Val Gly Thr Asp Gln Ala Thr Ile Thr Ser Val Asp Gly  
 130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
 145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
 165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
 180 185

<210> 20  
 <211> 187  
 <212> PRT  
 <213> Cardiovirus

<400> 20  
 Lys Asp Phe Leu Glu Ile Ala Gln Ile Pro Thr Phe Ile Gly Asn Lys  
 1 5 10 15

Val Pro Asn Ala Val Pro Tyr Ile Glu Ala Ser Asn Asn Ala Val Lys  
 20 25 30

Thr Gln Pro Leu Ala Val Tyr Gln Val Thr Leu Ser Cys Ser Cys Leu  
 35 40 45

Ala Asn Thr Phe Leu Ala Ala Leu Ser Arg Asn Phe Ala Gln Tyr Arg  
 50 55 60

Gly Ser Leu Val Tyr Thr Phe Val Phe Thr Gly Thr Ala Met Met Lys  
 65 70 75 80

Gly Lys Phe Leu Ile Ala Tyr Thr Pro Pro Gly Ala Gly Lys Pro Thr  
 85 90 95

Ser Arg Asp Gln Ala Met Gln Ala Thr Tyr Ala Ile Trp Asp Leu Gly  
 100 105 110

Leu Asn Ser Ser Tyr Ser Phe Thr Val Pro Phe Ile Ser Pro Thr His  
 115 120 125

Phe Arg Met Val Gly Thr Asp Leu Pro Thr Ile Thr Ser Ala Asp Gly  
 130 135 140

Trp Val Thr Val Trp Gln Leu Thr Pro Leu Thr Tyr Pro Ser Gly Thr  
 145 150 155 160

Pro Thr Asn Ser Asp Ile Leu Thr Leu Val Ser Ala Gly Asp Asp Phe  
 165 170 175

Thr Leu Arg Met Pro Ile Ser Pro Thr Lys Trp  
 180 185

<210> 21  
 <211> 20  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 21  
 ggccgaagcc gcttgaata 20

<210> 22  
 <211> 19  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 22  
 gtggcttttg gccgcagag 19

<210> 23  
 <211> 16  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 23  
 acagtgcatt ccacac 16

<210> 24  
 <211> 15  
 <212> DNA  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Primer

<400> 24  
ccgctccaca ataga

15

<210> 25  
<211> 10  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Primer

<400> 25  
gatctcagac

10